

REMARKS

Applicants thank the Examiner for the thorough consideration given the present application. Claims 1 and 2 are currently being prosecuted. The Examiner is respectfully requested to reconsider his rejection in view of the amendments and remarks as set for the below.

Entry of Amendment

Applicants submit that entry of this of this amendment is appropriate since it only deletes two words which were considered indefinite. No new issues are being added and the number of issues for appeal are being reduced. Accordingly, entry of the amendment and full consideration of the file is respectfully requested.

Finale of the Rejection

Applicants request that the finality of the present rejection be removed. It is noted that the Examiner has instituted a new rejection causing Applicants to make minor changes to claim 1 in the previous actions. Applicants submit that this did not require an issuance of a new rejection on art that had not been previously cited. Accordingly, Applicants request the finality of the previous action be removed.

Telephone Interview

Applicants note with a appreciation the telephone interview conducted with Examiner Barrera on January 30, 2008. In the course of the interview, it was agreed that two words would removed from claim 1 to overcome the 35 U.S.C. § 112 rejection. Also, extensive arguments were made concerning the obviousness of changing the size of the airgap 9 in the Binder Magnete (DE3928066) reference. The Examiner contended that changing the size of the airgap would be obvious. Applicants submitted that in view of the arrangement of the magnetic flux changing the size of the airgap would be detrimental. Since neither party had any translation in their possession, it would was agreed that a translation should be obtained for a better understanding of the operation of the device and especially the arrangement of the magnetic flux

of this reference of this reference. Accordingly, a partial translation has been obtained and is attached for the Examiner's convenience.

Rejections under 35 U.S.C. § 112

Claims 1 and 2 stand rejected under 35 U.S.C. § 112, second paragraph as being indefinite. The Examiner objected to the terms "much smaller" and "substantially". By way of the present amendment, Applicants have cancelled "much" and "substantially" in order to avoid these problems. Accordingly, this rejection is overcome.

Rejection under 35 U.S.C. § 103

Claims 1 and 2 stand rejected under 35 U.S.C. § 103 as being obvious over Binder Magnete (DE39 28 066) in view of Kubach (U.S. Patent 4,546,339) or Boyd (U.S. Patent 3,792,390) this rejection is respectfully traversed.

The Examiner states that Binder Magnete shows a valve actuator having a actuator member 12 movable under the effect of resilient member 24 and at least one coil 13 and at least one permanent magnet 10 arranged to hold the actuating member in one of the extreme positions. The Examiner also points out an airgap 9. The Examiner states that this reference does not show an airgap of a size that is much smaller than the thickness of the permanent magnet. Kubach and Boyd show an airgap of a size that is smaller than the thickness of a permanent magnet in an equivalent structure. The Examiner feels that one of ordinary skill in the art would find it obvious to substitute an airgap of the size that is much smaller than the thickness of the permanent magnet.

The discussion of the size of the airgap is found in the specification on page 5, lines 22-27 in particular. As indicated there, the airgap (e) needs to be large enough, to prevent the flux from the permanent magnet looping through the second facets but small enough to reduce the losses of flux from the coil that passes through the first facets and the permanent magnet. As seen in the figures, the airgap e is much smaller than the permanent magnet H. This arrangement is designed so that the field from the coil does not pass through the permanent magnet itself and thus does not tend to demagnetize the permanent magnet.

The Binder Magnete reference consist of having a coil 11 and a compensation coil 13, a permanent magnet 10 and an airgap 9. However, the operation of this device is completely different than that of the present invention. As a result, a change the size of the airgap would not be obvious even in view of Boyd and Kubach. Applicants are submitting herewith an English translation of the portion of the reference from column 3, lines- 33-66 which is the part pf the reference which deals with the operation of the magnets. The sentence that is important has been underlined in the translation for emphasis and does not appear in the original German.

This translation makes it clear that the second magnet 10, 13, 14, 15 and 15a is designed to close the valve. The bucking coil 12 is used to neutralize the magnetic field of the permanent magnet, so that armature is attracted by the magnet system 11, 16 to open the valve. Thus, it appears, that the permanent magnet 10 operates in opposition to the coil 11 to close the valve and to hold the valve closed. When the bucking coil 13 is actuated, the permanent magnet is neutralized so that only the coil 11 acts on the armature pulling it downwardly and thus opening the valve. It is important to note that the operation of the bucking coil is to neutralize the permanent magnet and not to deviate it. Thus, the resulting field has the same direction but a much lower intensity than the field of the permanent magnet. Applicants submit that with this understanding of the operation of the reference device it becomes clear to one skilled in the art that making the airgap 9 smaller would not be advantageous and that it would not be obvious to one skilled in the art to reduce the size in the airgap as presently claimed. In view of this Applicants submit that claim 1 defines over this combination of references.

Claim 2 depends from claim and as such is also considered to be allowable.

Conclusion

In view of the above remarks, it is believed that claims clearly distinguish over the patents relied on by the examiner either alone or in combination. In view of this, reconsideration of the rejections and allowance of all of the claims are respectfully requested.

Should there be any outstanding matters that need to be resolved in the present application; the Examiner is respectfully requested to contact Robert F. Gnuse, Reg. No. 27,295 at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

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Respectfully submitted,

By 

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English translation of DE 39 28 066 column 3 lines 31-66

Opposite to the first magnet system comprising of the ring-shaped magnet coil 11 and the pot-shaped core 16, is the second magnet system 10, 13, 14, 15, 15a, designed for closing the valve. It consists of a ring-shaped permanent magnet 10, which is contained lateral to the valve of an external pole 15a and opposite to yoke 15. The armature rod 17 is carried through a cylindrical internal pole 14 being contained coaxial to yoke 15. On the face of the second magnet system lateral to the armature, a ring shaped bucking coil 13 is designed between the magnetic gap 9 and the external pole 15a and the internal pole 14. The magnetic field of the permanent magnet 10 can be neutralized by the bucking coil 13 for trapping the armature 12 by the smaller dimensioned magnet system 11, 16 to activate the opening of the valve. The diameter of the permanent magnet 10 due to physical reasons is greater than the diameter of electromagnet consisting of the magnet coil 11 and the core 16. In order to keep the diameter of the permanent magnet as small as possible the internal pole 14 contains a magnetic raw material with a maximum saturation flux density e.g. made from a 50% ferric-cobalt alloy. Yoke 15 and the external pole 15a consist of a more advantageous evolvent form of glad sheets with a constant thickness. Yoke 15 and external pole 15a show a greater diameter at the bezel of the permanent magnet 3, narrowing conical with gradual diminution of cross-section such that the outside diameter of the external pole 15a is a little smaller than the diameter of the pot-shaped core 16. This leads to the result of an advantageous weight of the armature, resulting in an improved response of a rotational frequency and in the reduction of the mechanical wear.